

WHAT IS CLAIMED IS

1. A boot for covering and protecting a fluid level detecting switch, the boot comprising:

a flexible material having an interior volume adapted to receive and flexibly accommodate a movable float portion of the switch therein;

a connecting portion for connecting the boot to a corresponding attachment portion of the float switch;

an engaging portion for providing watertight engagement with an inner wall of a reservoir, wherein the movable float portion of the float switch is adapted to pivot within the interior volume of the boot in response to changes in a liquid level in the reservoir.

2. The boot according to claim 1, further comprising an accordion shaped stem portion adapted to facilitate insertion of the float switch into the interior volume of the boot and accommodate movement of the movable float portion therein.

3. The boot according to claim 1, wherein the connecting portion of the boot cooperatively engages the attachment portion of the float switch.

4. The boot according to claim 1, wherein the boot comprises a flexible impermeable material selected from a group consisting of rubber, plastic, and composite materials.

5. A boot for covering and protecting a fluid level float switch, the float switch comprising:

a float disposed at an end of a float shaft, the float shaft adapted to pivot about a pivot point located at an end of a float switch arm, the float switch arm having a detent disposed proximate an opposite end from the pivot point, the

float switch arm having connecting means for connecting the float switch to an interior wall of a reservoir; and the boot comprising:

a resilient material having an interior volume adapted to flexibly accommodate the float switch arm therein;

a connecting portion for connecting the boot to the detent on the float switch arm;

a compressible wall engaging portion for providing watertight engagement with the inner wall of the reservoir, wherein the float is adapted to pivot within the boot in response to changes in a liquid level in the reservoir.

6. The boot according to claim 5, further comprising an accordion shaped stem portion adapted to facilitate insertion of the float switch into the interior volume of the boot and accommodate movement of the float therein.

7. The boot according to claim 5, wherein the connecting portion of the boot cooperatively engages the detent on the float switch arm.

8. The boot according to claim 5, wherein the boot comprises a flexible material selected from a group consisting of rubber, plastic, and composite materials.

9. A combination fluid level float switch and boot for covering and protecting the float switch, the float switch comprising:

a float disposed at an end of a float shaft, the float shaft adapted to pivot about a pivot point located at an end of a float switch arm, the float switch arm having a detent disposed proximate an opposite end from the pivot point, the float switch arm having connecting means for connecting the float switch to an interior wall of a reservoir; and the boot comprising:

a flexible material having an interior volume adapted to flexibly accommodate the float switch arm therein;

a connecting portion for connecting the boot to the detent on the float switch arm;

a compressible wall engaging portion for providing watertight engagement with the inner wall of the reservoir, wherein the float is adapted to pivot within the boot in response to changes in a liquid level in the reservoir.

10. The combination float switch and boot according to claim 9, further comprising an accordion shaped stem portion adapted to facilitate insertion of the float switch into the interior volume of the boot and accommodate movement of the float therein.

11. The combination float switch and boot according to claim 9, wherein the connecting portion of the boot cooperatively engages the detent on the float switch arm.

12. The combination float switch and boot according to claim 9, wherein the boot comprises a flexible material selected from a group consisting of rubber, plastic, and composite materials.

13. The combination float switch and boot according to claim 9, wherein the connecting means for connecting the float switch to the interior wall of the reservoir is a threaded portion.

14. The combination float switch and boot according to claim 9, wherein downward movement of the float initiates replenishment of liquid within the reservoir.

15. The combination float switch and boot according to claim 9, wherein upward movement of the float cause inflow of liquid into the reservoir to cease.

16. The combination float switch and boot according to claim 9, wherein the float switch arm has a hollow orifice for directing electrical wires from within the interior volume of the boot to an exterior of the reservoir.

17. A fluid level detecting switch comprising:

a switch including a mountable shaft having an end adjacent a point of mounting and an end distant therefrom, a first fixed contact and a second movable contact, said second contact having a first fixed end and a second free end, said shaft including a stop element configured to engage said second free end when the switch is activated, said stop element being positioned such that said second contact can engage said first contact, but that after contact said second contact is constrained from applying further pressure against said first contact by said stop element;

a boot of flexible material having capable of completely covering said contacts and insulating them from fluid, said boot having a first flexible portion generally adjacent said mounting end of the shaft and a second substantially rigid portion generally adjacent said second contact, said second portion of said boot being capable of displacing sufficient fluid so that when the fluid level rises above said boot, it is caused to flex along said flexible portion and thereby cause said rigid portion to engage said second contact and drive it toward said first contact.

18. A switch according to claim 17 wherein said flexible portion of said boot includes a bellows and where in said rigid portion includes a pair of walls which intersect substantially orthogonally.

19. A switch according to claim 17 wherein said rigid portion includes a contact point, as viewed from the inside of the boot, said contact point being positioned, adjacent said second free end of said switch, so that when said boot is flexed, said contact point will engage said free end and drive the contacts into electrical engagement with each other.

20. A switch according to claim 17 wherein said rigid portion includes a bulbous portion and a contact portion both in rigid connection with each other.

21. A switch according to claim 17 wherein said second contact includes a shock absorbing element positioned adjacent said stop element and wherein said absorbing element is positioned to engage said stop element immediately after said first and second contact make electrical contact with each other.

22. A switch according to claim 21 wherein said shock absorbing element includes a curved portion and a tip, said tip being oriented to engage said stop element.

23. A switch according to claim 17 wherein said rigid portion is created in part by walls of the boot intersecting orthogonally on either side of said contact point.

24. A boot for a level detecting switch having a pair of electrical contacts mounted on a shaft attachable to a fixture comprising:

a fluid tight enclosure material capable of completely covering said contacts and insulating them from fluid, said boot having a first flexible portion surrounding said shaft at the fixture end and a second substantially rigid portion generally adjacent said contacts, said second portion of said boot being capable of displacing sufficient fluid so that when the fluid level rises above said boot, it is caused to flex along said flexible portion and thereby causes said rigid portion to engage at least one of said contact and drive it toward the other contact.

25. A fluid level detecting switch, comprising:

a rigid stem, capable of being attached within a fluid reservoir;
a fixed electrical contact rigidly attached to the stem;

a movable electrical contact rigidly attached to the stem at one end and movable at a point distant from said fixed end;

said contacts being positioned so that they can change electrical state;

a boot surrounding and in fluid tight engagement with said stem, said boot including:

a flexible portion;

a rigid portion; and

a float portion;

said rigid portion including a boot contact point for engaging said movable contact, said boot contact point being flexibly attached to said flexible portion and attached to said float portion, so that when said float portion moves in response to changes in the fluid level, it will cause said boot contact point to engage said movable contact and thereby cause the contacts to change electrical state.

26. A fluid level detecting switch, comprising:

a rigid stem, capable of being attached within a fluid reservoir;

a fixed electrical contact rigidly attached to the stem;

a movable electrical contact rigidly attached to the stem at one end and movable at a point distant from said fixed end;

a safety stop on said rigid stem for engaging said movable contact and for limiting pressure applied to said fixed contact through said movable contact;

said contacts being positioned so that they will become electrically engaged with respect to each other just before said safety stop limits the engagement pressure therebetween;

a boot surrounding and in fluid tight engagement with said stem, said boot including:

a flexible portion;

a rigid portion; and

a float portion;

said rigid portion including a boot contact point for engaging said movable contact, said boot contact point being flexibly attached to said flexible portion and

attached to said float portion, so that when said float portion moves in response to changes in the fluid level, it will cause said boot contact point to engage said movable contact and thereby cause the contacts to be electrically engaged.

27. A method of switching electric current flow in response to changing levels of fluid, comprising the steps of:

- (a) enclosing electrical contacts within a fluid tight boot,
- (b) positioning a rigid part of the boot adjacent said contacts,
- (c) allowing the boot to rise or fall in response to fluid levels, so that said rigid part will come in to an out of contact with said contacts in response to fluid levels thereby changing the conductivity of the switch.